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John F. Kennedy Space Center



First Shuttle launch anniversary – April 12, 2001

Team members look back 20 years

When Columbia lifted off the pad the morning of April 12, 1981, becoming the first Space Shuttle to launch – thousands of Kennedy Space Center team members watched with fervent emotions.

The launch of an orbiter strapped to an external tank and two solid rocket boosters was a spectacle that had never been seen before.

KSC workers knew they had contributed to the success of a new vehicle that would transform the space program.

The new Space Transportation System program had been under development for 10 years, and the launch was a tremendous payoff.

This space vehicle was no “one

(See LAUNCH, Page 8)



STS-1

Crew: John W. Young, Commander
Robert L. Crippen, Pilot

Backup: Joseph H. Engle, Commander
Richard H. Truly, Pilot

Rollout: Columbia rolled to Pad 39-A on Dec. 29, 1980.

Launch: Columbia launched on April 12, 1981, at 7 a.m. EST

Landing: April 14, 1981, at 10:21 a.m. PST, Edwards Air Force Base, Calif.

Mission duration: 37 orbits, two days, six hours, 20 minutes, 53 seconds

KSC director led processing efforts

Dick Smith was KSC's director when Columbia rolled out to the pad for her first launch.

Of course, it was a big media event, and the reporters wanted a quote from the Center Director. He gave them one, but Smith, originally from Decatur, Ala., asserts that they got it wrong. "I said 'Ain't it purty,' but they quoted me as saying 'Ain't it pretty.'"

Center Director at KSC from September 1979 to August 1986, Smith first arrived just shortly after Columbia was delivered to KSC. Smith had been deputy director of the Marshall Space Flight Center, but was serving as the deputy associate administrator for Space Transportation Systems at NASA Headquarters before he arrived at KSC.

He was in much better condition than Columbia, though, which still needed a lot of processing before its first launch.

Smith remembers talking to one KSC employee, a grandfather, who fondly recounted bringing his young grandson out to the Shuttle Landing Facility to witness history unfolding: Columbia perched atop the Shuttle Carrier Aircraft before its move into the Orbiter Processing Facility.

His grandson was unimpressed, however, and observed "that airplane sitting on top is sick."



Former KSC Director Dick Smith is pictured in the Vehicle Assembly Building during the processing of Columbia for STS-1.

One of the biggest challenges of the workforce during Smith's tenure as director was developing the ground processing routines and procedures for the orbiters that have become so streamlined today. It was a slow, painful process.

Every procedure was being done for the first time. Every step was like pulling a tooth. "We had a lot of toothaches," Smith laughed. Then, as now, KSC was very fortunate to have the quality and dedication of the employees.

"What brings people together is a crisis

One of the biggest challenges of the workforce during Dick Smith's tenure as director of Kennedy Space Center was developing ground processing routines and procedures for the orbiters that have become so streamlined today. It was a slow, painful process.

because they forget the trivial things," Smith observed. "KSC is unique in that a launch is like a crisis, a scheduled crisis. If you watch the team closely, you see petty quarrels and squabbling fade away as the team heads into a launch. The team pulls together to handle the crisis."

— Kay Grinter

Launch director kept team 'keyed up'

Despite the computer trouble that scrubbed the first launch attempt of Columbia on STS-1, George Page said the Kennedy Space Center team still felt fully prepared.

"I felt a tremendous relief when Columbia did launch on the second attempt. We had worked very hard, and I spent most of my awake time out here. To see it go so well was very satisfying," said Page, who served as launch director for the first three flights of the Shuttle program, starting with STS-1 in April 1981.

Page had already worked for NASA for 18 years, as a spacecraft test conductor on the Gemini Program; chief spacecraft test conductor for Gemini and Apollo launch operations; chief of Spacecraft Operations Division for Apollo, Skylab and ASTP launch operations; director of Cargo Operations; and director of Shuttle Operation.

The biggest challenge to make that first launch "was keeping everyone keyed up and ready to go," Page said. "The schedule had dragged out — the original schedule was very optimistic and we worked under a lot of pressure to meet it. We had trouble installing tile on the vehicle, the solids of that size were new to us, there were new hardware and new systems. It



STS-1 Launch Director George Page speaks to the media after the first Space Shuttle launch.

was a challenging time. Everyone involved deserves a lot of credit."

The distant future wasn't a concern for those working to launch the first Shuttle. "Most of us then were so wrapped up doing the job we didn't think much into the future," said Page. "We didn't think, though, that we would still be flying Shuttle. We thought it would have progressed to other vehicles."

Page retired from NASA in 1984. He remains on the Space Coast with continued interest in the Shuttle launches and evolving program.

"(STS-1) was the most satisfying program I ever worked on. To see it go and know it was safely on orbit, and then see it come back to Earth — incredible."

George Page
Launch Director, STS-1

That interest must be an inherited trait since, said Page, "my son works on the Shuttle program for NASA in California and my grandson works on launches from the firing room at KSC."

When asked for any final thoughts about launching STS-1, Page stated, "It was the most satisfying program I ever worked on. To see it go and know it was safely on orbit, and then see it come back to Earth — incredible."

— Anita Barrett

Reyes' team met tile challenges

Ernie Reyes was enjoying his job in payload planning in 1979, working with both expendable vehicles and to transition deployable payloads to the Space Shuttle program.

His goal was to develop a ground support system to meet the customer need for payloads to arrive at the pad as close to launch as possible.

Columbia, however, was to draw Reyes away from that task after a call from George Page, the Space Shuttle launch director. The installation of the thermal protection tiles had run into difficulty and was behind schedule.

Making good progress on the payload ground support system, Reyes was reluctant to change assignments. But Page wanted Reyes to become the Kennedy Space Center "tile czar."

"We don't need any payloads if the Space Shuttle doesn't work," launch director Page reminded Reyes.

Good point, and Reyes became the NASA-KSC Thermal Protection System lead. His job description was simply to get all the tiles installed on Columbia before launch.

Initially the tiles were not passing a required "pull test," a rigorous test to assure the tiles would not fall off Columbia during its first launch.

"Because the tiles had the consistency of Styrofoam, we were popping them right off," recalled Reyes.

He joined the Thermal Protection System team, NASA and Rockwell International engineers assigned to solve the tile-bonding problem. A special gray-colored slurry coating was developed that could be applied to the underside of the tile.

After curing overnight, there was found to be dramatic improvement in the bonding characteristic of the tile. As a result, an enormous project called "tile densification" began for all of the more than 31,000 tiles that were being attached to Columbia.

"The pull test then showed that we were able to far exceed the strength we needed," said Reyes.



A view of Columbia in an Orbital Processing Facility at Kennedy Space Center before the first Shuttle launch. The orbiter's exterior looks damaged because it had lost many of its Thermal Protection System tiles during a test flight aboard its carrier aircraft at Edwards Air Force Base.

The tile work for STS-1 was a tremendous undertaking. At that time there were no computers to help with the job. It was all done with books of drawings, pencil, paper and colored crayons. Tags were affixed to tiles indicating some stage of repair or the status of other work in progress.

The technicians became proud of working on what looked like a huge jigsaw puzzle, wearing shirts that read "Power to the Puzzle People."

"Not near enough credit has ever been given to all the people at the end of the rope. We had strong technicians doing the job and a strong shop to support them. They were really dedicated to what they were doing," said Reyes. "The NASA and Rockwell management were also very dedicated. It was the best possible example of a joint government/industry team working at KSC."

After STS-1 only 16 tiles of the more than 31,000 had come off.

By STS-2, none came off. But by then Reyes had returned to payloads becoming the deputy director of payload operations – and he got to finish that payload ground support system.

– George Diller

"Not near enough credit has ever been given to all the people at the end of the rope. We had strong technicians doing the job and a strong shop to support them."

Ernie Reyes,
Thermal Protection System Lead for STS-1



Jeff Andress, now a Thermal Protection System manager with United Space Alliance, was one of the first tile technicians hired. Above, he takes a look at Columbia's modern tile system.

Tile technicians had hands full

Processing Columbia for the first Shuttle launch was a steep learning curve for everyone, especially those in tile installation.

"Tile installation was the most demanding, tedious process at KSC," recalled Dick Smith, director of the Kennedy Space Center when Columbia was being prepared for launch for the first time.

A 15-minute test flight of the orbiter-Shuttle Carrier Aircraft combination at Edwards Air Force Base resulted in extensive damage to the tiles on Columbia. As the 747 took off, parts of the plastic-foam dummy tiles, attached by tape to the areas around the windows, fuselage sides, wings and midtail began to fall off.

When the flight ended, the orbiter had lost not only some of the dummy tiles, but some of the 26,000 real tiles already bonded in place, as well. Problems with the tile adhesive alone would keep employees busy for months until it was resolved.

Many young people were hired to do the tile work. They were high school graduates who were given on-the-job training.

Jeff Andress was one of those hired. He was 20 years old in 1979, and his career at KSC has centered around tile installation and manufacturing.

"We were very critical of what we were doing. Everyone who worked with the tiles back then remembers the first time he damaged one," Andress said.

– Kay Grinter

Liftoff of C



"With the first Shuttle launch being such an historic event, the atmosphere on Center was very festive. At the time of liftoff, the feeling was both that of excitement and apprehension."

Jim Jennings
KSC Deputy Center Director

"At that time, I was the facility manager for the OPF. I viewed the launch on the towway in front of the OPF. The launch was unbelievable! It was thrilling."



Ann Montgomery
Deputy Director, Safety, Health and Independent Assessment



"I grew up here and was used to the Apollo launches. STS-1 was a different experience. The Apollo vehicles would lift slowly off the pad; the Shuttle just hopped off the pad!"

Ray Lugo
Acting Director, Joint Performance Management Office

"I was excited and nervous. I was also proud, because I could go back to school in the fall and tell all my friends that I was a member of the team for the launch that made history."



Michele Taylor
Electronics Engineer, Spaceport Engineering and Technology



A jubilant launch team celebrates the successful launch of Columbia on STS-1 April 12, 1981.



A crowd gathered at Jetty Park in Cape Canaveral to watch the first Space Shuttle launch. continues to be a popular site for watching Shuttle and rocket launches.

olumbia!



81, with an eruption of flag waving in Firing Room 1 at Kennedy Space Center.



The park

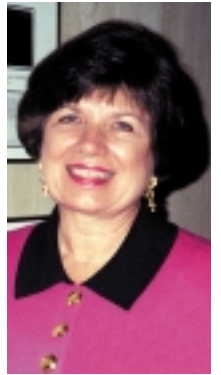


Silhouetted by the morning sun and rising Shuttle, viewers track Columbia's ascent on the first Space Shuttle launch.

"It was so nice to be launching again after the transition between the Space Shuttle program and the Apollo Soyuz Test Project and the gap in launching."

JoAnn Morgan

Director, External Relations and Business Development



"At the time of STS-1, I was the VAB Site Manager. We couldn't wait to get out to the pad. Everybody was so dedicated. Everyone recognized this is a milestone that will go down in history."

Conrad Nagel

Chief, Shuttle Project Office

"STS-1 was my very first launch and I was excited and relieved at liftoff. It was wild! Everyone was ecstatic! All the testing, meetings, reviews, and hard work paid off."

Ruth Harrison

Technical Assistant, Shuttle Processing



"I viewed the launch from home with my children. The feeling I experienced was tremendous pride. Hard work really does pay off. I also was nervous, hoping everything would go O.K."

Ping Yu

Chief, Mechanical/Civil Design Branch, Spaceport Services

Launch tradition gets its start

A much-celebrated Kennedy Space Center launch tradition began with STS-1.

Since that first Shuttle liftoff, launch controllers have enjoyed beans and cornbread as an immediate payoff for a successful launch.

Former NASA Test Director Chief Norm Carlson started the tradition with one small crock pot of northern beans for his hungry staff.

The tradition grew in popularity and Carlson turned the cooking over to KSC's food service contractor.

Now, hundreds of launch team members, managers and dignitaries swarm the Launch Control Center lobby after each launch dipping into twelve 18-quart cookers brimming with beans.

This popular tradition wafts the aroma of launch success through air ducts, into the elevators, out the automatic doors and into the parking lot.

As time passed, workers enjoyed new customs and diversions from a demanding line of work.

"We have a very professional and focused team here, but we don't have to wait for launch day to blow off a little steam," said Dave King, KSC's Shuttle Processing Director. "We like to celebrate the smaller victories along the way as well."

In the early days, a NASA flow manager started bringing in doughnuts to celebrate the roll over of the Shuttle from the Orbiter Processing Facility to Vehicle Assembly Building (VAB).

As we became more health conscious though, some chose to bring in bagels.

Why doughnuts and bagels? Maybe because they are round like a wheel and the Shuttle is rolling to the VAB. No one seems to know. Whatever the reason, it's quite a treat to watch the Shuttle creeping toward the VAB while snacking on doughnuts or bagels.

At KSC, any excuse to have a barbecue is acceptable, but team accomplishments make them that much sweeter. Whether KSC managers are thanking workers for a job well done, or technicians and

Successful Launch Beans

Courtesy of Norm Carlson, former NASA Test Director Chief

Put 6 lbs. of dried **Great Northern Beans** in an 18-quart electric cooker.

Cut 10 lbs. of **smoked ham** into cubes.

Add ham and ham bones to beans.

Add ½ shaker of **lemon pepper**.

Add 3 lbs. chopped **onions**.

Add 2 stalks chopped **celery**.

Add 1 tsp. **liquid smoke**.

Cover with water and cook for at least 8 hours.

Enjoy!

Famous Launch Day Cornbread

Martha White Self-Rising Corn Muffin Mix

Follow directions on box.



Above, launch team members and guests enjoy beans and cornbread after a successful launch. The tradition began with STS-1. At right, another launch tradition: KSC Director Roy Bridges cuts Mike Leinbach's tie after the launch of STS-106, Leinbach's first launch as Launch Director.



their families are hanging out with astronauts after two days of Shuttle and payload inspections, a cookout brings everyone down to earth. When every face is covered with sauce, titles don't matter as much and everyone gets treated like family.

"These traditional gatherings are good for morale and introduce workers to the crew that's about to

fly in their Shuttle," explains Jim Halsell, Shuttle launch integration manager. "As an astronaut, the cookouts gave me an opportunity to say thanks face to face."

One of the few KSC traditions that excludes eating is the cutting of a rookie's necktie after launch. A customary practice among aviators following their first solo flight, launch directors, NASA test

directors and engineers humbly endure this borrowed ceremony.

Only a few minutes after main engine cutoff, a KSC manager uses scissors to hack off the necktie just inches below the knot – in front of the entire launch team. If food was allowed in the firing room, a cookout would likely top-off this tradition as well.

– Joel Wells

Program evolves over years

It has been two decades since the first Space Shuttle roared into history. How things in the program have changed since then.

"Initially we saw a tendency to document everything" recalls Ron Phelps of the Shuttle Processing Directorate Business Office. "We had to videotape each individual tile after the landing and compare it to how they'd been configured before launch. Nowadays, some of those areas we're not as concerned about because we've proven the reliability of the vehicles' systems."

Tom Overton, Multi-Flow Integration Manager, saw comparative changes involving the vehicle when the crew size was bumped from two astronauts to four crewmembers.

"For the first four flights, there were only two crewmembers," Overton said, "and they each had an ejection seat. I was a 'forward observer' on those first four flights. We looked through binoculars after the orbiter cleared the swing arm, watching the Shuttle for fires or anything else. It was exciting because the guys could bail out if they had to."

A touch of nostalgia always slips into the voices of those who have seen the program evolve.

"I grew up in this area, and when the first Shuttle launched, I was still looking at it through a young man's eyes," recalls Rick English, resource manager in the Shuttle Processing Directorate Business Office. "Since then, I've watched launches from many different perspectives. No two are alike, and all of them are beautiful to watch, but the first was the most impressive. It's like eating a good steak. I always enjoy it, but it was really interesting the first time."

Of the many changes in the program, likely the most visible is the designated preferred landing site. STS-1 was always slated to land at Edwards Air Force Base, Calif. But over the course of the life of the Shuttle program, landings at Kennedy Space Center's Shuttle Landing Facility have become commonplace while landings at Edwards have become rare.



Multi-Flow Integration Manager Tom Overton has seen many changes in the Space Shuttle Program since STS-1 days when he was working as NASA's lead operations engineer in charge of rollout and mate of the orbiter.

"The Space Shuttle is at the point that while we know it still has its hazards, we also know the Shuttle has proven itself over the past 20 years to be a very reliable piece of hardware."

Ron Phelps
Shuttle Processing

"The focus was to land out at Edwards, where you had plenty of room in case of a problem during landing," Phelps said. "But as we added nose wheel steering, improved braking systems, and chutes, we became a lot more comfortable landing here at KSC."

In fact, the entire program has matured, Phelps acknowledged.

"The Space Shuttle is at the point that while we know it still has its hazards, we also know the Shuttle has proven itself over the past 20 years to be a very reliable piece of hardware."

— Anna Heiney

First Flight Facts

- The original April 10, 1981, launch date of STS-1 was postponed to April 12 because of a timing skew between the primary and backup general computers.
- The STS-1 launch was the first of 24 liftoffs from Pad 39A.
- After the STS-1 launch, Columbia landed at Edwards Air Force Base on April 14 and then returned to KSC on April 28.
- Major Shuttle systems tested successfully on the first flight of the Shuttle Transportation System.
- Columbia sustained tile damage on launch from an overpressure wave created by the solid rocket boosters. Subsequent modifications to the water sound suppression system eliminated the problem.

Columbia, then and now

Columbia, the first Space Shuttle ever launched, recently returned from The Boeing Co.'s Palmdale, Calif., plant where it was refurbished and upgraded.

More than 100 major modifications were made over 18 months to make the vehicle safer and more efficient and reliable, as well as to expand its capabilities.

Modifications included installation of a \$9 million "glass cockpit" with high-tech electronic instruments and flat-panel displays.

The orbiter's weight was reduced to increase its payload capacity to orbit and it was equipped with better space-debris protection.

Other modifications:

- A Global Positioning System (GPS) satellite navigation receiver was installed.

- Columbia's thermal protection system tiles were upgraded.

- The orbiter was modified to be able to allow for possible Space Station missions.

The recent overhaul was Columbia's fourth visit the orbiter has made to Palmdale. On its first trip, Columbia was outfitted for long-duration flights. Modifications included an improved toilet, extra stowage, a carbon dioxide removal system and additional hydrogen and oxygen tanks.

Columbia is the only orbiter outfitted to stay in space up to 30 days. Its longest duration flight so far is nearly 18 days.

— Kathy Hagood



At left, Columbia is readied on Pad 39-A for the first Shuttle Space launch on April 12, 1981. The Shuttle's signature orange external tank was painted white, a practice that ended with STS-2 because of the added weight of the paint. Above, a modernized Columbia returned to KSC last month after 18 months of refurbishment in Palmdale, Calif. More than 100 major modifications were made to the orbiter. At bottom left, STS-1 astronauts Robert Young and Bob Crippen review Columbia's cockpit controls before their mission. Below, Columbia's newly installed \$9-million "glass cockpit" is seen while the orbiter is being processing in Orbiter Processing Facility bay 1.



LAUNCH ...

(Continued from Page 1)

shot" wonder. It would launch again and again to lift payloads to orbit and provide a orbiting microgravity laboratory.

Columbia and other members of the Shuttle fleet have launched more than 100 times during the past 20 years.

STS-100, scheduled at presstime to launch aboard Endeavour April 19, will be the 104th Shuttle launch and the 9th International Space Station mission.

The Shuttle team members who

watched that first launch could only imagine what amazing payloads the new vehicle would lift into orbit and what new discoveries the new program would allow.

Twenty years later, *Spaceport News* is giving voice to those first Shuttle Program team members who worked at KSC to revisit the wonder of the beginning of a program that continues to make history. Much has happened since then, but the excitement of working on a team that launches Shuttles continues.

— Kathy Hagood



John F. Kennedy Space Center

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